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#### Palabras clave (DeCS)

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# TRANSPARIETOHEPATIC BILIARY DRAINAGE: EXPERIENCE IN THE UNIVERSITY HOSPITAL AND MEDICAL CENTER OF CARACAS\*

Drenaje biliar transparietohepático: experiencia en el Hospital Universitario y Centro Médico de Caracas

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## Summary

**Introduction:** Biliary transperitoneal drainage (BTHD) is a therapeutic element, temporary or definitive, through which the biliary path is accessed, being able to leave a catheter to decompress it. **Indications:** Impossibility of resolving biliary pathology by other methods (ERCP), treating the biliary tract in biliary-enteric anastomosis (stenosis), location and treatment of biliary fistulas or malignant pathology. **Objectives:** evaluate the experience of the interventional radiology unit of the University Hospital of Caracas (UHC) and Medical Center of Caracas (MCC) in the management of BTHD. **Method:** Retrospective, descriptive, cross-sectional study, with non-probabilistic and intentional sampling. The casuistry from the combination of patients in MCC period 2002 to 2017, and UHC from 2010 to 2017 was statistically processed. 528 patients were obtained, of which 174 were operated on, making 702 cases performed in both institutions. Arc equipment fluoroscopy was used. Data was processed in IBM SPSS 22.0. Results: 702 cases, average age  $54 \pm 2$ . 58.7% of female patients  $n = 310$ . Main incidence of malignant pathological etiology  $n = 329$  patients (62.3%), followed by benign pathology headed by postsurgical stenosis of biliodigestive in  $n = 191$  patients (36.1%). The malignant pathology with highest percentage is pancreatic ADC with  $n = 156$  (29.5%). Procedures performed obtained a greater percentage of internal external drainage 48%  $n = 254$ . **Conclusions:** BTHD is an effective technique with a low rate of complications for the treatment of obstructive jaundice. Our experience has been statistically optimal with good results.

## Resumen

**Introducción:** El drenaje biliar transparietohepático (DTPH) es un procedimiento terapéutico, temporal o definitivo, mediante el cual se cateteriza la vía biliar para descomprimirla. Indicaciones: Imposibilidad de resolver la patología biliar por otros

métodos (CPRE), tratar la vía biliar en anastomosis bilioentéricas (estenosis), localización y tratamiento de fistulas biliares o patología maligna. **Objetivos:** Evaluar la experiencia de la Unidad de Radiología Intervencionista del Hospital Universitario de Caracas (HUC) y Centro Medico de Caracas (CMC) en el manejo de DTPH. **Método:** Estudio retrospectivo, analítico, de corte transversal, con muestreo no probabilístico e intencional. Se procesó estadísticamente la casuística obtenida de la combinación de pacientes atendidos en el CMC entre 2002 y 2017, y en el HUC entre 2010 y 2017, en una población de 528 pacientes, de los cuales 174 fueron reintervenidos, para un total de 702 casos de ambas instituciones. Se utilizó el equipo de arco en "C" fluoroscopia. Se procesaron datos en IBM SPSS 22.0. **Resultados:** 702 casos, promedio de edad  $54 \pm 2$ . El 58,7 %, mujeres ( $n = 310$ ). Principal incidencia de etiología de patología maligna  $n = 329$  pacientes (62,3 %), seguido por patología benigna encabezada por estenosis posquirúrgica biliodigestiva en  $n = 191$  pacientes (36,1 %). La patología maligna en mayor porcentaje la constituye el ADC de páncreas con  $n = 156$  (29,5 %). En los procedimientos realizados se obtuvo un mayor porcentaje de drenaje interno-externo 48 % ( $n = 254$ ). **Conclusiones:** El DTPH constituye una técnica efectiva con poco índice de complicaciones para tratamiento de ictericia obstructiva. La experiencia evaluada ha resultado estadísticamente óptima con buenos resultados.

## Introduction

Biliary transparietohepatic drainage (BTHD) is a therapeutic procedure, temporary or definitive, by means of which the biliary duct is accessed to insert a catheter or prosthesis (stent) that allows it to be decompressed (1, 2). Among its indications are: 1) Impossibility to resolve biliary pathology by other methods, mainly ERCP, 2) first option in performing biliary drainage, to treat the biliary duct in bilioenteric anastomosis (stenosis), 3) location and treatment of biliary fistulas (3,4).

Most of the time, BTHD is a palliative procedure that aims to improve the quality of life of patients (5). This article aims to evaluate the efficacy and number of complications in patients with obstructive jaundice treated with BTHD.

## 1. Theoretical framework. Description of the procedure

BTHD is an image-guided procedure: fluoroscopy, ultrasound or a combination of the two. Its indications are varied. For the treatment of obstructive jaundice include: cholangitis, pain relief, pruritus, decrease in serum bilirubin; facilitate access to the biliary system for other palliative interventions such as stent placement or transhepatic brachytherapy for cholangiocarcinoma (6,7).

Adequate antibiotic coverage should be instituted before and after the procedure. Before the procedure begins, the three-dimensional images, i.e., the patient's computed tomography (CT) or magnetic resonance imaging (MRI) to determine the site of obstruction (8,9) (Figure 1), should be reviewed.

The procedure is performed with the patient in supine position through subcostal or right intercostal or left subxiphoid or ductal approach. Using local anesthesia at the puncture site, the skin is opened with a scalpel.

Puncture: entry 1-2 cm posterior to the axillary midline in the 11th intercostal space above the upper edge of the lower rib (10). For entry into the left bile duct the location of the puncture is subxiphoid. Fine needle type Chiba of 22G and 15 cm is used.

The direction of needle entry should be parallel to the table, discreetly caudocraneal. With the patient in apnea, the needle is advanced up to 2-3 cm before the right ridge of the spine. Continuous injection of contrast material through the needle results in repletion of the bile ducts.

Subsequently, a 0.018 guide is then inserted through the fine needle in a peripheral bile duct. The needle is removed and an introductory 6F is inserted; a 0.038-inch hydrophilic guide is placed through it and a biliary manipulation catheter is passed. A teflon guide (Amplatz super Stiff) is then advanced and dilators and the drainage catheter (11-13) are passed (Figure 2).

The patient should be hospitalized one day to monitor for possible major complications, especially sepsis and hemobilia. The administration of antibiotics is continued (14).

The major complications are cholangitis, sepsis, biliary peritonitis, hemorrhage and pancreatitis (15, 16).

Biliary stenting may be performed endoscopically, percutaneously, or by a combination of the two methods. Stents may be plastic or metal, the selection of the type of stent depends on the aetiology of the biliary obstruction of the patient's life expectancy and affordability (17, 18) (Figure 3).

The use of balloons is indicated to dilate stenosis of the main bile duct or biliodigestive anastomosis, usually with good results: the passage from the hydrophilic guide to the duodenum is achieved after insufflation of the balloon (19-21) (Figure 4).

The search related to the article was conducted with a series of key questions, biliary and stent search terms, as well as words relevant to specific key questions. Searches were made of MedLine (through PubMed), Cochrane Library, SERAM and internet. The databases consulted come from the hemodynamic units of the Hospital Universitario de Caracas and Centro Médico de Caracas.



Figure 1. Cholangiorresonance with 3D reconstruction for diagnostic evaluation of intrahepatic bile duct dilation secondary to stenosis following biliodigestive surgery.



Figure 2. Fluoroscopic images of the procedure for the placement of BTHD. a) Injection of contrast medium with Chiba needle no. 22, with filling of the intrahepatic bile duct: significant stenosis is observed 1.5 cm from the bile confluent. b) Insertion of hydrophilic guides to the right and left intrahepatic bile ducts. c) Placement of biliary catheter in the right and left intrahepatic bile ducts. d) Adequate opacification of the intrahepatic bile ducts, with left external drainage and internal-external drainage on the right side.



Figure 3. Adequate opacification of endoprosthesis in the common bile duct. Small stenosis is evident at 1 cm from the biliary confluent.



Figure 4. Bile duct dilation balloon filled with contrast medium placed in the common bile duct.

## 2. Method

Retrospective, analytical, observational and cross-sectional study, with non-probabilistic and intentional sampling. Carried out between 2010 and 2017, with patients between 3 and 91 years of age with obstructive jaundice, attended in the haemodynamics unit of the HUC and CMC. Interventions were performed with fluoroscopic C-arm equipment, Philips Allura Xpert FD20 combined with an image-guided operating table. The casuistry obtained from patients seen at the CMC from 2002 to 2017, and from the HUC from 2010 to 2017, was statistically processed for a study population of 528 patients, of which 174 were re-interviewed, thus forming 702 cases performed at both institutions.

## 3. Statistical analysis

A database was made in the statistical program SPSS 19, for Windows. Statistical averages were analyzed such as the mean and standard deviation of continuous variables, in the case of nominal variables, frequencies and percentages were calculated. The results were available in tables of one and two entries, depending on the case. In addition, Microsoft Excel 2016 was used to format the tables. Ethical aspects: The study was carried out following the bioethical norms established by the Declaration of Helsinki (2008); it was approved by the bioethics committee of the Centro Médico de Caracas and the Hospital Universitario de Caracas. These aspects were complied with by all persons involved in the research. Informed consent was given in each case.

## 4. Results

Study population 528 patients, of which 174 were reinterviewed, for a total of 702 cases performed in both institutions. The average age was  $54 \pm 3$  years. 58.7% were women ( $n = 310$ ), 41.3% were men ( $n = 218$ ). It was found that the highest incidence per age group for BTHD was between 50- 59 years with  $n=158$  (30%), followed by 60-69 years,  $n = 120$  (22.7%), and 40-49 years,  $n = 76$  (14.3%) (Figure 5).

The main etiology was malignant pathology  $n = 329$  patients (62.3%), followed by benign pathology headed by stenosis following biliodigestive surgery in  $n = 191$  patients (36.1%), sclerosing cholangitis  $n = 5$  patients (1%) and congenital atresia of bile ducts  $n = 3$  (1%) (Figure 6).

It was determined that benign obstruction constituted by stenosis after biliodigestive surgery is more frequent in the decade of 50-59 years with 81%. This is inversely proportional to the incidence of obstruction by neoplasia of bile ducts, which represents 20% in the 60-69 years decade (figures 7 and 8).

Within the malignant pathology, it was evidenced that the highest percentage is constituted by adenocarcinoma of the pancreas with  $n = 156$  (29.5%), followed by extrinsic tumors to the bile duct that secondarily produce stenosis  $n = 99$  (18.7%). It is followed by neoplasms of the bile ducts: cholangiocarcinoma and Klatskin tumour  $n = 49$  (9,2 %) and those of the gallbladder (carcinoma and metastasis)  $n = 25$  (4,9 %) (Figure 9).

The 60-69 age group has the highest incidence of pancreatic cancer, with 70% of cases. For extrinsic tumours causing intra- or

extrahepatic bile duct stenosis, a higher incidence of hepatocarcinoma was found with  $n = 46$  (8,7 %), followed by gastric carcinoma  $n = 15$  (2,8 %), non-Hodgkin lymphoma  $n = 14$  (2,6 %), oesophageal cancer  $n = 10$  (1,8 %) and lung cancer metastases  $n = 8$  (1,5 %) (Figure 10).

In reference to the types of procedures performed: was performed in a higher percentage internal-external drainage 48 % ( $n = 254$ ), in a lower percentage external drainage in 23.4 % ( $n = 124$ ), taking into account referrals for cholangitis or obstructions that were managed to convert in a second time to internal-external drainage. 10% ( $n = 54$ ) of the patients were dilated with 18.3% ( $n = 96$ ) balloon desolved Stent Zilver stent placement, indicated by its malignant pathology (Figure 11).

Evolution of the shunt: The catheter remained permeable for one month in 14.2% ( $n = 75$ ) of patients, for 3 months in 10.9% ( $n = 58$ ) and for 6 months or more in 70.4% ( $n = 372$ ).

$N = 96$  (18.3%) stents were placed satisfactorily. Of these, obstruction occurred in  $n = 64$  (12.1%). This obstruction occurred at 3 months in 12.1%. Of 64 patients (17.1%), 82.8% had stent permeability for one year or longer. There were 174 re-interventions. Balloon dilation in 16.6% ( $n = 88$ ).

BTHD proved to be a low-risk procedure with no complications in 407 patients (77%); in terms of immediate complications during surgery, 28 patients (5.9%) suffered haemobilia and 27 patients (5.4%) presented postoperative infection (Figure 12).

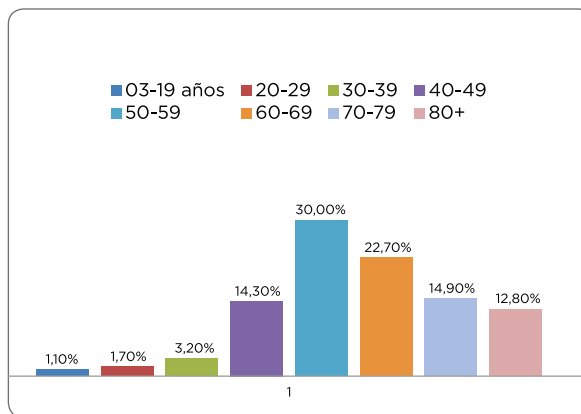


Figure 5. BTHD by age group.

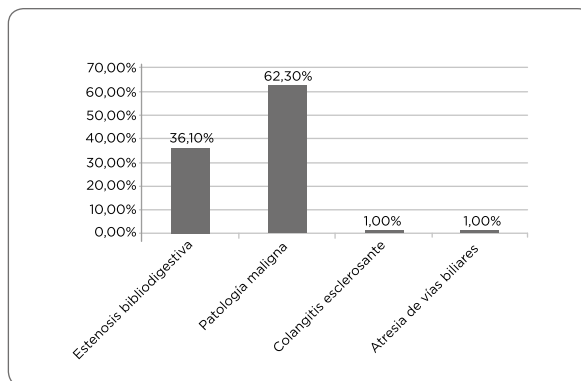


Figure 6. Etiology of obstruction in the patients studied.

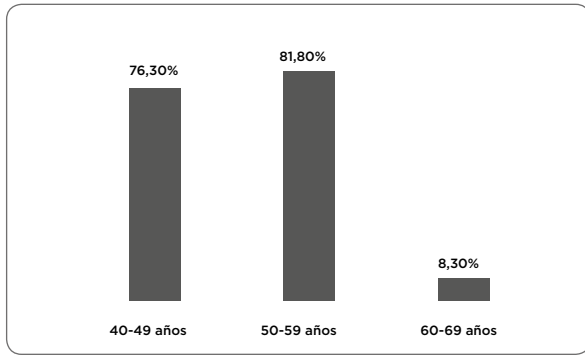


Figure 7. Incidence of biliodigestive postoperative stenosis by age group.

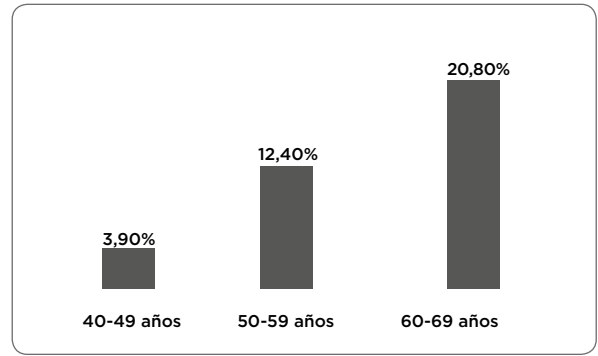


Figure 8. Incidence of obstruction by neoplasia of bile ducts by age group.

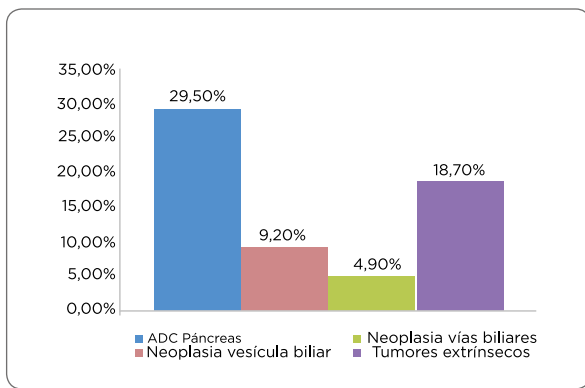


Figure 9. Incidence of malignant pathology in patients studied with placement of BTHD.

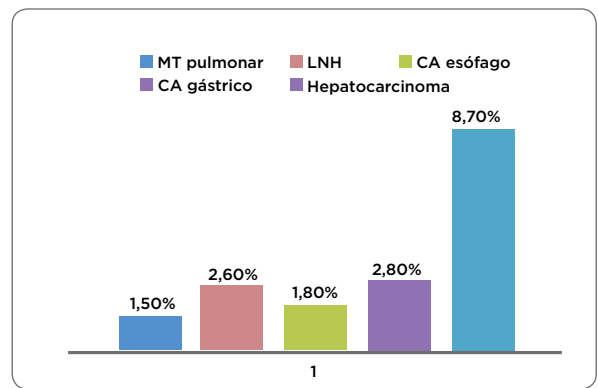


Figure 10. Incidence of extrinsic tumors in the studied population.

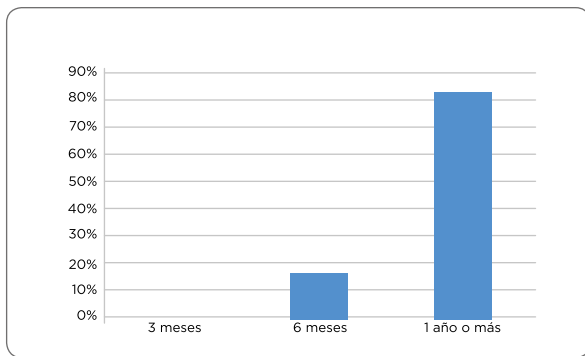


Figure 11. Incidence of temporary obstruction of the endoprosthesis.

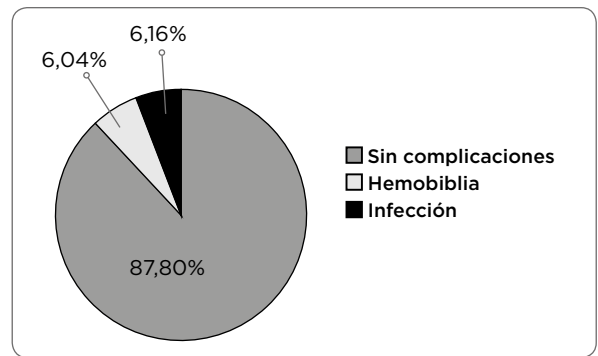


Figure 12. Percentage of complications of the procedure.

## 5. Conclusion

BTHD, practiced by trained medical personnel, is a safe and effective technique for the treatment of icteric obstructive syndrome. Recent advances in the technique of the procedure, improved availability of the material, and increased experience in its implementation have resulted in a significant reduction in overall morbidity and mortality in cases of malignant obstructive

jaundice. However, the long-term prognosis remains bleak in malignant obstructive jaundice due to the relentless progression of the primary disease. BTHD is an effective technique for the treatment of obstructive jaundice with low incidence of complications. Our experience shows statistically optimal results with good outcomes of the procedure.



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